

## Claims

1. Battery separator based on thermoplastic, ultra-high molecular-weight polyolefin with an average molecular weight by weight of at least 300,000, **characterized in that** it contains, relative to the sum of the weights of filler and polyolefin, 10 to 100 wt.-% polyolefin and 0 to 90 wt.-% filler, and, relative to the weight of the separator, 5 to 35 wt.-% oil and 0.5 to 5.0 wt.-% of a compound according to the Formula (I)



in which

R is a non-aromatic hydrocarbon radical with 10 to 4200 hydrocarbon atoms, which can be interrupted by oxygen atoms,

$R^1$  is H,  $-(CH_2)_k COOM^{x+}_{1/x}$  or  $-(CH_2)_k - SO_3 M^{x+}_{1/x}$ , where k is 1 or 2,

M is an alkali metal or alkaline-earth metal ion,  $H^+$  or  $NH_4^+$ , where not all the M variables simultaneously have the meaning  $H^+$ ,

n is 0 or 1,

m is 0 or an integer from 10 to 1400 and

x is 1 or 2,

the ratio of oxygen atoms to carbon atoms in the compound according to Formula (I) lying in the range between 1:1.5 to 1:30 and m and n not being able to simultaneously be 0.

2. Battery separator according to claim 1,  
**characterized in that** it contains a compound according to the Formula (I) in which  
R is a hydrocarbon radical with 10 to 180 carbon atoms, which can be interrupted by 1 to 60 oxygen atoms,  
n is 1,  
m is 0 and  
x is 1 or 2.
3. Battery separator according to claim 2,  
**characterized in that** R is a hydrocarbon radical of the formula  $R^2-[(OC_2H_4)_p(OC_3H_6)_q]-$ , in which  
 $R^2$  is an alkyl radical with 10 to 30 carbon atoms,  
p is an integer from 0 to 30 and/or  
q is an integer from 0 to 30.
4. Battery separator according to claim 3,  
**characterized in that**  
p is an integer from 0 to 10 and  
q is an integer from 0 to 10.
5. Battery separator according to claim 3 or 4,  
**characterized in that** the sum of p and q is smaller than or equal to 10.
6. Battery separator according to one of claims 2 to 5,  
**characterized in that**  $R^1$  is H.
7. Battery separator according to claim 1,  
**characterized in that** it contains a compound according to the Formula (I), in which

R is an alkane radical with 20 to 4200 carbon atoms,

M is an alkali metal or alkaline-earth metal ion,  $H^+$  or  $NH_4^+$ , where not all the variables M simultaneously have the meaning  $H^+$ ,

n is 0,

m is an integer from 10 to 1400 and

x is 1 or 2.

8. Battery separator according to claim 7, **characterized in that** R is an alkane radical with 50 to 750 carbon atoms.
9. Battery separator according to claim 7 or 8, **characterized in that** the compound according to Formula (I) is a poly(meth)acrylic acid, whose acid groups are at least partly neutralized.
10. Battery separator according to claim 9, **characterized in that** at least 40% of the acid groups of the poly(meth)acrylic acid are neutralized.
11. Battery separator according to one of claims 7 to 10, **characterized in that** M is  $Li^+$ ,  $Na^+$  or  $K^+$ .
12. Battery separator according to one of claims 7 to 11, **characterized in that** the poly(meth)acrylic acid has an average molar mass  $M_w$  of 1,000 to 100,000 g/mol.

13. Battery separator according to one of claims 1 to 12, **characterized in that** it contains a component which can form one of the compounds named in claims 1 to 12 when the separator is used for the intended purpose.
14. Lead-sulphuric acid accumulator with at least two oppositely-charged electrode plates, **characterized in that** it contains at least one battery separator according to one of claims 1 to 13.
15. Process for the preparation of a battery separator according to one of claims 1 to 13, **characterized in that** a compound with the Formula (I) or a solution of a compound with the Formula (I) is applied to a battery separator and the separator is then optionally dried.
16. Process for the preparation of a battery separator according to one of claims 1 to 13, **characterized in that** a homogeneous mixture of thermoplastic polymer, at least one compound with the Formula (I) and optionally filler and further additives are prepared, formed into a web-shaped material and then one or more of the further additives are optionally removed.
17. Use of a compound with the Formula (I) for the preparation of battery separators.
18. Use of a compound with the Formula (I) for the improvement of the oxidation resistance of thermoplastic polymers or battery separators.